

## *DRGs in Portugal : a decade of experience*

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### **1. Introduction and purpose**

Diagnosis Related Groups (DRGs) are a classification system for hospital inpatient care that groups together cases which could be expected to use similar amounts and kinds of resources. Although in their original development, the DRGs were intended as tools to facilitate utilisation review activities, they were later used as the basis of hospital prospective payment for the US Medicare programme.

Subsequently the use of DRGs for hospital financing has become widespread not only in the US but also in an increasing number of other countries. In this regard Portugal has taken a leading role, having implemented DRGs at a national level in the context of a budgeting system for the public inpatient sector.

This paper summarises the work that has been under way for the last decade in Portugal, in respect to the implementation of DRGs in the National Health Service (NHS) hospitals.

### **2. Brief overview of the DRG project**

DRGs were formally introduced in Portugal through a contract between the Ministry of Health and a US agency, aimed at the development and implementation of a fully integrated information system for the management and financing of hospitals.

At the end of 1984, a proposal was presented by Yale University for technical assistance to support the development of a hospital DRG based information system. Because the results of this preliminary project were most encouraging, it was decided that the system should be extended to all NHS hospitals and that its use as a resource allocation tool should be considered. In July of 1989, the Ministry of Health contracted SOLON Consulting Group for the provision of technical assistance in the development and handling of a DRG based resource allocation model. In 1990 the NHS hospitals' production in DRG terms was for the first time used to define their funding requirements for inpatient care.

### **3. The implementation phase**

#### **3.1 Grouping the data**

Prior to 1989, several actions were taken in view of the implementation of DRGs: diagnosis and procedure coding was changed to ICD-9-CM and training courses in coding for physicians were delivered for all hospitals. Although most of the hospitals in Portugal had centralised medical records departments, there were few specialised professionals in this area. As the training of medical coders was not feasible in the short run, the Ministry of Health decided that physicians should be assigned responsibilities for coding activities.

A standard discharge abstract containing a uniform basic data set was established for all NHS hospitals. A DRG grouper package including a simple management module was also implemented at the hospitals, enabling all levels of management to measure and control their performance. All hospitals had staff trained in its use, and DRG grouping of discharges started to be done on an ongoing basis at each hospital in January of 1989.

### **3.2 Costing the products**

The method of costing the DRGs reflected a pragmatic view considering that data on hospital costs is not available at the patient level. A top-down approach was implemented where department level costs are apportioned to DRGs based on a) relative cost weights derived from US statistics and b) patient specific length of stay information. This method leads to patient level costs that can be used to calculate the national DRG cost weights.

More recently (1994) and in order to validate these DRG cost weights, panels of physicians were convened by the Ministry to evaluate the proposed values. As a result, some of the weights have been modified and the whole set re-normalised to keep the cost of the national average patient as the reference value.

### **3.3 Designing and developing a DRG based funding system**

Since 1990 DRGs have been used to establish rates for third party payments (mainly occupational insurance), which represent between 15% to 20% of hospitals' inpatient revenue and to adjust the financial allocations to hospitals from the National Health Service (NHS) Budget, which represent between 80% and 85% of hospitals' inpatient revenue.

The DRG rates that are set for third party payers reflect national average costs and are the basis for a per case payment system. Per diem instead of DRG rates are applied to short-stay outlier and transfer cases while per diem amounts additional to the DRG rates are established for long stay outliers. A recent proposal was made to implement maximum length of stay thresholds beyond which the patients are only credited a limited amount to cover room and board expenses.

For the NHS allocation, a budget is computed for each hospital based on the number of patients that the hospital is expected to treat during the forthcoming year times its base rate and times its case-mix index.

The constraints of the context in which NHS hospitals operate have been considered by defining base rates that allow cost differences between the hospitals. In practice, the base rate for a given hospital is based on a blend of the hospital specific and a standard cost per case. A schedule has been established so that the hospital's specific component declines over time while giving the hospitals opportunity to learn and adjust to the system, to gradually reach payment rates which will be evenly divided between hospital specific and standard cost per case.

The blending percentage implemented in 1990 was set at 90% hospital specific and 10% national rate. In accordance with the proposed schedule the hospital specific



component decreased in 1991 to 85%. From 1992 additional adjustments were built into the budgeting process through the use of hospital peer groups. Peer grouping appears to be a pragmatic way to ensure comparability between hospitals and to guarantee that certain hospitals are not penalised for the role that they play in delivering health care.

The hospital blended rates were set in 1992 at 80% hospital specific and 20% group average costs. The blending percentage was subsequently set at 75% hospital specific both for 1993 and 1994 and was provisionally set at 70% for 1995 budget year.

The budgeting formula also accounts for differences in cost related to outlier and transfer cases. These funds are reflected in each hospital's number of discharges, using the concept of discharge equivalents, whereby short stay, long stay and transfer days are expressed in terms equivalent to inlier cases. In addition a recent adjustment to the costing model allocates relatively more physician costs to the first two days of an inpatient stay. This adjustment is based on research conducted elsewhere (RAND 1990).

Finally the hospital case-mix index is determined by applying to the discharge equivalents, a set of national DRG cost weights which express the relationship of one DRG to another in terms of their resource requirements.

### **3.4 Setting prices for ambulatory surgery**

Work is being conducted to expand case-mix funding with the inclusion of one day surgeries using selected DRGs which physicians defined as including cases that can, under certain circumstances, be treated on an ambulatory basis. The proposed methodology treats these cases as "zero days" stays and discounts the national DRG weights to accommodate the room and board portion of hospital inpatient expenses. The objective is to create incentives for the hospitals to treat more cases on an ambulatory basis.

### **3.5 Expanding the system with feedback information to the hospitals**

As a result of the implementation of DRGs, all NHS hospitals are required to send their DRG data on a monthly basis to the Ministry of Health to be integrated into a national database which is primarily used for rate setting and budgeting. This resultant database is, in addition, a low cost information resource which has proved to be useful to target areas for utilisation review and quality assessment. Since 1992 periodic feedback reports to the hospitals containing a set of performance and quality indicators including length of stay, readmission rates for surgical procedures, complication rates and age-adjusted mortality rates enable comparisons of the individual hospitals with national and peer group values.

The merit of this type of retrospective statistical analysis is twofold. First, the reviews of individual cases by specially trained staff, which are labour intensive and time consuming, are directed at areas with major deviations from the norms. Second, hospital or service patterns in respect to the selected indicators can be established and monitored.

#### **4. Evaluation of the experience**

The status of implementation of the DRG system in 1996 can be summarised in a series of achievements which outweigh the specific objectives of resource allocation and payment. These are briefly presented below:

- All public acute care hospitals with the exception of psychiatric and rehabilitation facilities produce case-mix information on a routine basis;
- a basic DRG hospital information system is established at each hospital, providing the managers with tools that enable them to better understand their production and to communicate with physicians in a common language. This leads to a more successful establishment and monitoring of objectives and targets for the services;
- a centralised national DRG database with over 4 million records containing administrative and clinical data at the patient level is available for statistical analyses, morbidity studies and quality and utilisation reviews;
- finally a so called "case-mix culture" is being gradually diffused across the country providing a useful commonality of conceptual and operational attitudes toward hospital management and financing.

Concerning resource allocation and payment, the objectivity and rationality of the DRG approach have been seen as positive aspects in spite of the difficulties of shifting actual resources between hospitals within the NHS. Further, the DRGs have made the system more equitable for the payers, in that the NHS pays its share and the other payers pay comparable amounts, albeit not adjusted for the hospitals' peer group. Between 1990 and 1994 the hospitals' inpatient revenue from third party payers increased about 140% whereas the corresponding increase which would have resulted from the application of per diem rates to the same patients would have been about 100%.

#### **5. Selected Results**

The impact of the DRG system on hospital activity can be measured along several dimensions including changes in inpatient volume, case mix and length of stay.

As shown in Table 1 the number of total discharges increased about 9% between 1990 and 1995. Inlier cases also exhibited the same pattern of increase but the number of long stay cases declined while short stay cases increased and the count of transferred patients was stable (Figure 1). This pattern is a result of the reduction in average length of stay (ALOS) shown in Table 2. Specifically, this trend is more significant for procedures DRGs than for medical DRGs (Table 3) which may reflect the ability of treating increasingly complex cases as one day surgeries.

As presented in Table 4, case-mix complexity augmented. This reflects both improvements in coding and a real increase in the complexity of cases treated on an inpatient basis. As treating more complex patients will enlarge length of stay, the decline observed in overall ALOS may be more significant than it initially appears to be. Thus, we believe that the joint effect of the increase in case mix and the decrease



in length of stay illustrated in Figure 2 is a positive result. The specific variation in ALOS for the most frequent DRGs (Table 5) reinforces this finding.

These are, in general, expected results to the extent that one of the major advantages of DRG based funding is that it creates incentives for hospitals to operate more efficiently. Using a hospital's output of treated cases to establish the basis for its funding provides that hospital with the financial incentive to treat more cases and to treat them as efficiently as possible. A recent study conducted by Dismuke (1996) relative to one of the most frequent DRGs in the NHS hospitals, DRG 14 - Specific Cerebro-vascular disorders except TIA, points out a decline in national length of stay of about 13% between 1992-1994, after controlling for the effects of patient and hospital characteristics. Using a theoretical hospital behaviour model first developed by Lave and Frank (1990) adapted to the Portuguese environment, the author concludes for the effect of the DRG system on the positive behaviour of hospital managers.

## **6. Future Perspectives**

The Ministry of Health intends that a case-mix approach will be implemented for ambulatory care. In this regard, a project is being undertaken to assess the feasibility of assigning Ambulatory Patient Groups (APGs) to Portuguese data. Eight pilot hospitals have been selected to group outpatient clinics production in 8 speciality areas: Internal Medicine; General Surgery, Cardiology, Ophthalmology, Orthopaedics, ENT, Pneumology and Urology. Several actions were already taken in this regard, including the definition of an "outpatient contact" as the unit of measure for the hospital ambulatory services; the development of a uniform basic data set; a microcomputer based package including the 3M APG grouper module; and the preparation of lists of pre-codified diagnoses and procedures for each clinical specialty.

## **7. Concluding Remark**

In spite of the problems that almost invariably accompany change and of the operational difficulties of an efficiency oriented approach in a National Health Service environment, the implementation of DRGs in Portugal was a crucial step for the introduction of a new attitude towards hospital management and financing centred on an innovative concept of inpatient product.

The expected extension to the ambulatory sector will supply additional building blocks for a comprehensive system with global incentives for a more effective and efficient delivery of health care.

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**TABLE 1**

**EVOLUTION OF NUMBER OF PATIENTS BY TYPE OF CASES**

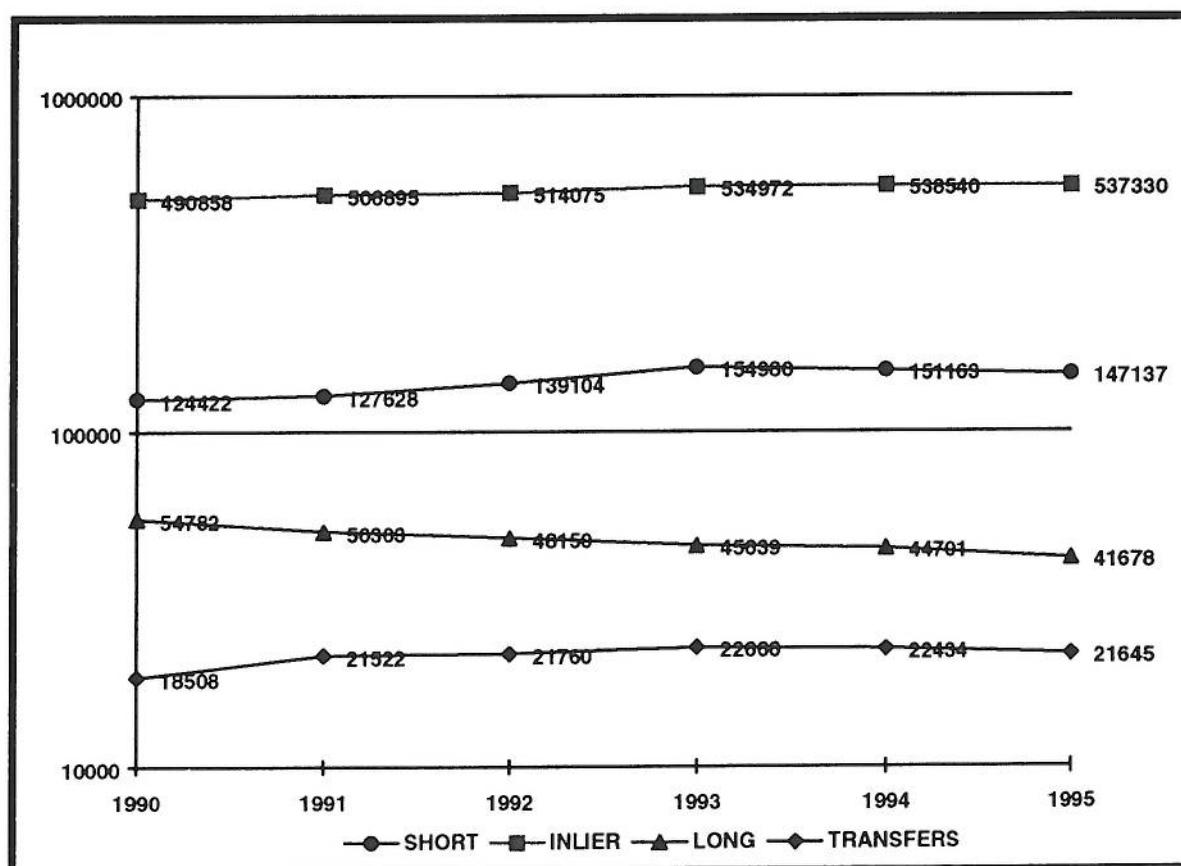
YEAR	SHORT	INLIER	LONG	TRANSFERS	TOTAL
1990	124422	490858	54782	18508	688570
1991	127628	506895	50303	21522	706348
1992	139104	514075	48150	21760	723089
1993	154980	534972	45639	22666	758257
1994	151163	538540	44701	22434	756838
1995	147137	537330	41678	21645	747790

Note: Excludes IPOs, H. Capuchos, H. S. José, H. D. Guarda and H. D. Almada

Source: IGIF/DDSFG

**FIGURE 1**

**EVOLUTION OF NUMBER OF PATIENTS BY TYPE OF CASES**





**TABLE 2**

**AVERAGE LENGTH OF STAY**  
**CUMULATIVE PERCENT CHANGES**

YEAR	ALOS	$\Delta$ %
1990	7.95	
1991	7.79	-2.01%
1992	7.58	-4.65%
1993	7.31	-8.05%
1994	7.38	-7.17%
1995	7.22	-9.18%

**Note:** Excludes IPOs, H. Capuchos, H. S. José, H. D. Guarda and H. D. Almada  
ALOS excluding deaths and transfers  
**Source:** IGIF/DDSFG

**TABLE 3**

**ALOS: MEDICAL AND PROCEDURES DRGs**  
**CUMULATIVE PERCENT CHANGES**

YEAR	MEDICAL	PROCEDURES	$\Delta$ % MEDICAL	$\Delta$ % PROCEDURES
1990	7.74	10.46		
1991	7.65	9.98	-1.16%	-4.59%
1992	7.46	9.56	-3.62%	-8.60%
1993	7.21	9.09	-6.85%	-13.10%
1994	7.32	8.96	-5.43%	-14.34%
1995	7.28	8.48	-5.94%	-18.93%

**Note:** Excludes IPOs, H. Capuchos, H. S. José, H. D. Guarda and H. D. Almada  
ALOS excluding deaths and transfers  
**Source:** IGIF/DDSFG



**TABLE 4**

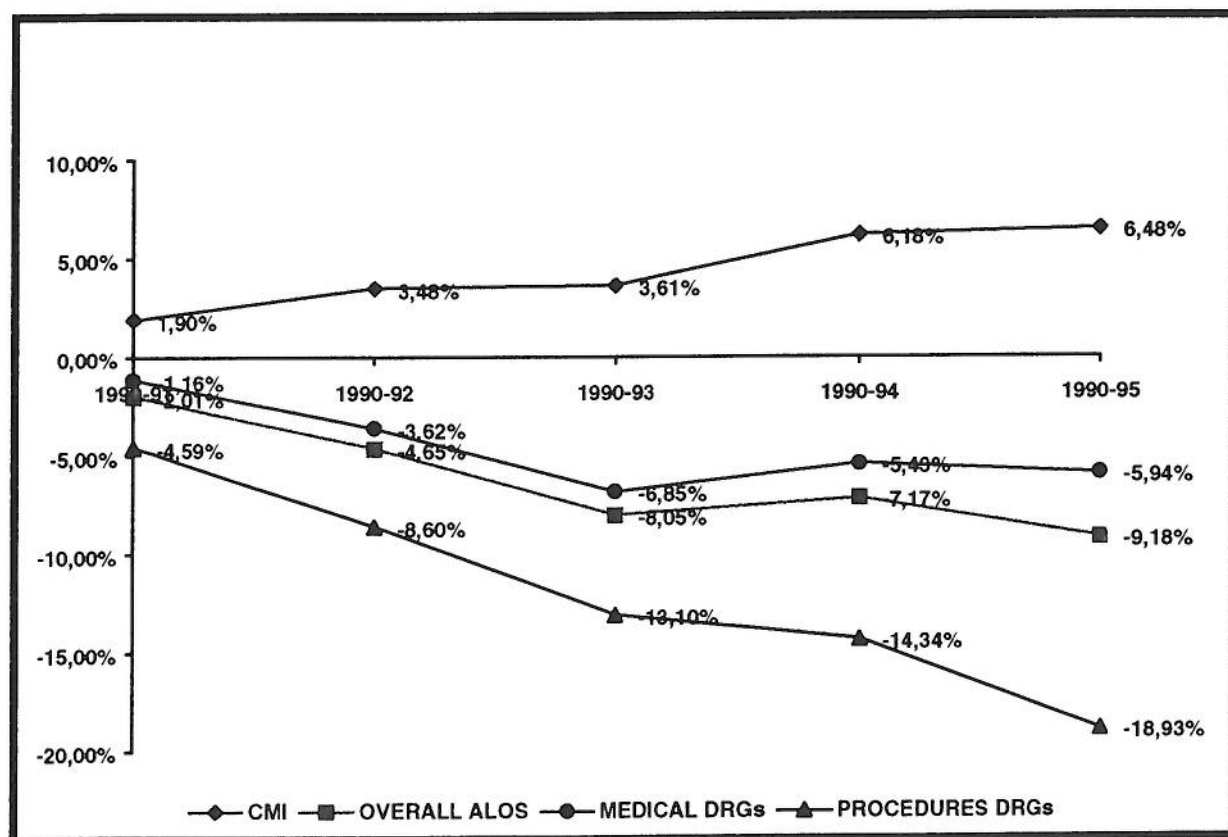
**CASE-MIX INDEX - CUMULATIVE PERCENT CHANGES**

YEAR	CMI	$\Delta$ %
1990	0.94952	
1991	0.96753	1.897%
1992	0.98257	3.481%
1993	0.98380	3.610%
1994	1.00809	6.184%
1995	1.01109	6.484%

**Note:** Excludes IPOs, H. Capuchos, H. S. José, H. D. Guarda and H. D. Almada  
**Source:** IGIF/DDSFG

**FIGURE 2**

**CMI, ALOS and ALOS of MEDICAL and PROCEDURES DRGs - CUMULATIVE PERCENT CHANGES**



**TABLE 5****ALOS COMPARISON FOR THE TEN MOST FREQUENT DRGs (\*)**

<b>DRG</b>	<b>NAME</b>	<b>ALOS</b>		<b>% VARIATION</b>
		<b>1990</b>	<b>1995</b>	<b>1990 - 1995</b>
<b>371</b>	Cesarean section w/o CC	6.82	5.80	-15.02
<b>14</b>	Specific cerebrovascular disorders except TIA	14.28	12.30	-13.84
<b>410</b>	Chemotherapy	2.65	2.29	-13.66
<b>127</b>	Heart failure & shock	11.11	9.77	-12.03
<b>390</b>	Neonate w other significant problems	3.69	4.16	12.67
<b>167</b>	Appendectomy w/o complicated principal diag w/o CC	4.97	4.21	-15.47
<b>359</b>	Uterine & adnexa proc for non-malignancy w/o CC	8.89	7.14	-19.66
<b>184</b>	Esopahgitis, gastroent & misc digest disorders age 0-17	3.08	2.81	-8.95
<b>381</b>	Abortion w D&C, aspiration, curettage or hysterotomy	1.99	1.73	-13.21
<b>162</b>	Inguinal & femoral hernia procedures age>17 w CC	7.22	5.20	-27.97

(\*) EXCLUDES NORMAL NEWBORN (DRG 391) AND VAGINAL DELIVERY WITHOUT COMPLICATING DIAGNOSIS (DRG 373)